Proceedings of the Iowa Academy of Science

Volume 26 | Annual Issue Article 25

1919

The Moss and Lichen Flora of Western Emmet County (An Annotated List of the Bryophytes and Lichens of the High Lake and Des Moines River Region)

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THE MOSS AND LICHEN FLORA OF WESTERN EMMET COUNTY.

(AN ANNOTATED LIST OF THE BRYOPHYTES AND LICHENS OF THE HIGH LAKE AND DES MOINES RIVER REGION.)

B. O. WOLDEN

The prairie region does not, as a rule, offer a very rich field for the student of mosses and lichens. However, the territory which this paper attempts to cover does present several features of interest not only to such students but to the general botanist as well. For here we have not only the level prairie, but also lakes and deep woods, dry wooded ridges and shady ravines and hillsides.

There are chiefly three localities represented in the collections on which this list is based. These are the wooded region around High lake and Mud lake; the bowlder-strewn knolls and hillsides east of Des Moines river near the southern part of the county; and the wooded hills and ravines west of Estherville. Of particular interest to the student of local plant life are the High lake and Estherville woods. Here are found a number of plants otherwise rare to this part of the state, many of which have not been reported by botanists. The Estherville woods are interesting ground for the collector because of the diversity of the topography, which is quite rough when compared with the surrounding country.

It has been the hope of the writer to prepare a more extended paper covering the entire flora of this region, but time has been lacking for completing the collections on which such a paper would have to be based. And as the war conditions make it unlikely that such a hope will be realized this paper is presented with its present limitations.

By most people these little forms of plant life are overlooked and yet it can not be said that they are at all inconspicuous. In the woods and groves the lichen growths meet our eyes wherever we look, almost as the tree trunks are, so to speak, clothed with lichens in more open situations. The old stumps are often covered with

different species of *Cladonia* and the prairie bowlders, when left undisturbed, are strangely mottled by the variously colored, mostly crustose lichens. Some of these are very beautiful objects when seen under a lens.

Mosses are among Nature's most beautiful handiwork. We will find this to be true whether we look at the luxuriant green carpet that lines the cool shady lake bank or hillside, or at an individual plant through a lens or a microscope. Though some kinds are very common in more open grassy woodlands, the largest number of species and the most luxuriant growth are found along shaded lake banks and hillsides facing an exposure away from the sun. To the nature lover such situations are often most enchanting, especially in early spring and during rainy days of autumn.

The author realizes that this list is far from complete. It is the result of odd hours spent in collecting on infrequent occasions and with long intervals. Another season of more systematic work would no doubt have added many species, and if this had been possible the publication of the paper would have been delayed until it could have been made more complete. However, it is believed that the list is fairly representative of the region and it is, therefore, presented with the hope that it may be of interest and assistance to some one who may, in the future, undertake the study of the lichen and moss flora of this or adjacent counties or localities. The writer knows of no other moss list for this section of the state. The lichen flora is fairly well represented in Professor Shimek's "The Plant Geography of the Lake Okoboji Region."

The writer has not depended on his own determination in making up this list. In order to add to the value of the paper duplicates of all the specimens collected, even of the common and well-known forms, have been submitted to the different curators of the herbariums of the Sullivant Moss Society.

The author is indebted to Miss Mary F. Miller, of Washington, D. C., formerly curator of the Lichen Herbarium, for the determination of the specimens of his earlier collections, and to the present curator, Mr. C. C. Plitt, of Baltimore, for the later collections. The mosses have been determined by Mr. George B. Kaiser, of Germantown, Pennsylvania, curator of the Society Moss Herbarium.

LICHENS

The greater number of lichens listed below were collected in the High lake vicinity. This will include most of the species growing on trees. On the other hand nearly all the rock-loving species were

collected on the bowlders which are so abundant along the hillsides and knolls bordering on the Des Moines river plain, on the east, near the south side of the county. Only a small number of species were found on earth, and most of these were from the Estherville woods.

The species growing on trees are found mostly in open situations and are especially abundant in rather dry upland woods. The heaviest growth is generally on the north side of the trunks, except when the trees face an opening, when the lichen growth is most abundant on the side exposed to the light. In low dense woods where little light penetrates, the trunks are almost without lichen growth. Apparently plenty of light without direct exposure to the sun is the most favorable situation for the species growing on tree trunks.

MOSSES AND LIVERWORTS

Contrary to what might be expected, the region offers many things of interest to the moss student. The banks around the lakes and the many smaller ponds and marshes offer many favorable situations for mosses and search reveals a fairly large number of species for a prairie country. Most of the species listed were collected around the lakes.

The species from Estherville were collected, mostly, on high ground near the top of the hillsides and slopes. At the time the collections were made there was a light covering of snow in the ravines which made it difficult to obtain material from such places. Many of these places being ideal for mosses it is likely that continued work during a more favorable time of the year would add several species to this list from the Estherville woods.

Hepaticæ are not common in this region. Only four species have been collected by the writer. Very likely a careful search might bring to light a few more from the Estherville locality.

NOMENCLATURE.

For lichens the nomenclature is, in the main, that of Zahlbruckner in Engler and Prantl, but in the arrangement of families and genera Fink's "Lichens of Minnesota" has been followed.

For mosses both the nomenclature and arrangement are mainly those of Engler and Prantl.

CLASS LICHENS.

SUB-ORDER CONIOCASPINEÆ.

Family Caliciaceæ.

Cyphelium tigillare (Pers.) Th. Fr. On old board fence near High lake.

SUB-ORDER GRAPHIDINEÆ.

Family Graphidaceæ.

Phægraphis dendritica (Ach) Muell. Eng. Collected on dead *Prunus virginiana*. Common at High lake.

Arthonia radiata (Pus.) Ach. On bitternut, "Cedar Island," Mud lake. Other specimens of *Arthonia* collected on bitternut near High lake, on wild plum near Mud lake, on willow in Estherville woods, have not been satisfactorily determined.

SUB-ORDER DISCOCARPINEÆ.

Family Lecidiaceæ.

Lecidea melancheima Tuck. On bitternut, High lake; also on cedar post; prairie south of High lake.

Buellia myriocarpa (D. C.) Mudd. On old wood, High lake.

Family Cladoniaceæ.

Cladonia sylvatica (L.) Hoffm. On old stump in High lake woods; very rare.

Cladonia bacillaris (Del.) Nyl. On decayed stump, High lake.

Cladonia cristatella Tuck. On old stumps at High lake and Estherville. One specimen marked by Miss Miller as "approaching var *paludicola* Tuck, but without soredia on primary squamules."

Cladonia mitrula Tuck. On soil; woods west of Estherville.

Cladonia verticillata Hoffm. On old stump; High lake.

Cladonia verticillata cervicornus (Ach.) Flat. On old stump: High lake.

Cladonia pyxidata neglecta (Floerte) Mass. On earth; abundant in Estherville woods.

Cladonia fimbriata (L.) Hoffm., var. *subulata* (L.) Wainio. On old stump near High lake and on earth on high ridge, west of Estherville.

Family Pannariaceæ.

Pannaria microphylla (Sw.) Moss. On prairie bowlder near Des Moines river.

Pannaria lanuginosa (Ach.) Koerb. On dead wood near Mud lake.

Family Peltigeraceæ.

Peltigera malacea (Ach.) E. F. On earth, along shaded hillside, north of Oak Hill cemetery, Estherville.

Peltigera canina (L.) Hoffm. On the earth; shaded hillsides, Estherville.

Peltigera canina spongiosa Tuck. Along southwest bank of Mud lake.

Family Leconoraceæ.

Acarospora belle (Nyl.) Hsse. On prairie bowlder near Des Moines river.

Lecanora subfusca (L.) Ach. On bitternut, High lake.

Lecanora hageni Ach. On dead wood in Crane grove.

Lecanora varia (Hoffm.) Ach. Frequent on dead wood, board fences, etc., High lake. Also on *Prunus americana* near Mud lake. Specimen collected on red cedar stump near High lake seems to be a variety of the above.

Family Pertusariaceæ.

Pertusaria pustulata (Ach.) Nyl. On *Prunus virginiana,* High lake.

Family Parmeliaceæ.

Parmelia cetrata Ach. On base of trees; east bank of Mud lake.

Parmelia borreri Turn. Very common throughout, on trees.

Parmelia saxatilis (L.) Ach. On bowlder in woods southwest of Estherville.

Parmelia caperata (L.) Ach. Common throughout and very conspicuous on account of the large size and bright straw-green color of the thalus. On tree stumps and stones.

Parmalina calicaris (L.) Fr. var. *fraxinea* (L.) Fr. Variable, but specimens collected have been referred to this subspecies. Mostly on dead trees.

Family Teloschistaceæ.

Caloplaca annabarina (Ach.) Zahlb. On prairie bowlders near Des Moines river.

Caloplaca cerina (Ehrh.) Zahlb. On prairie bowlders near the Des Moines and on dead wood, Crane grove.

Caloplaca cerina sideritis Tuck. On bowlder, shore of Mud lake.

Caloplaca gilva (Hoffm.) Zahlb. On the base of *Quercus macrocarpa,* bank of High lake.

Candelariella vitellina (Ehrh.) Muell. On prairie bowlder near the Des Moines.

Placodium microphyllinum Tuck. On red cedar stump, banks of High lake.

Placodium aurantiacum (Lightf.) Hepp. Very common on green ash.

Teloschistes chrysopthalmus (L.) Th. Fr. Quite abundant on trees and on old wood.

Teloschistes polycarpus (Hoffm.) Tuck. Common on trees.

Teloschistes lychnens (Ach.) Tuck. Common and appears to be variable.

Teloschistes concolor (Dicks.) Tuck. Abundant on trees, old wood and on rocks. One form appears to the writer to be var. *effusus* Tuck. But this has not been verified.

Teloschistes parietinus (L.) Th. Fr. Common on trees, High lake.

Family Physciaceæ.

Rinodina orcina (Ach.) Mass. On prairie bowlder, near Des Moines river.

Rinodina sophodes (Ach.) Koerb. On bitternut, High lake.

Physcia speciosa (Wulf.) Nyl. On earth, Estherville woods. A specimen collected on *Salix* on bank of High lake was referred to this species but is missing from the author's collection.

Physcia pulverulenta (Schreb.) Nyl. var *leucoleiptis* Tuck. Several specimens were referred to this subspecies by Mr. Plitt.

Physcia stellaris (L.) Nyl. Our most common lichen, found everywhere on trees.

Physcia tribacia (Ach.) Nyl. Abundant on oaks *(Quercus macrocarpa)* in pastured woods near High lake.

Physcia obscura (Schaer.) Nyl. Common on trees, High lake.

Physcia adglutinata (Floerke) Nyl. Very common on trees everywhere.

SUB-ORDER PYRENOCARPINEÆ.

Family Dermatocarpaceæ.

Dermatocarpon sp. uncertain. On prairie bowlder near Des Moines river.

CLASS BRYOPHYTES.

SUB-CLASS HEPATICEÆ.

Ricciella fluitans (L.) Br. The Slender Riccia. Both the terrestrial and the aquatic forms collected in small sloughs near Mud lake.

Ricciocarpus natans (L.) Corda. Purple-fringed Riccia. Abundant in a small slough near Mud lake. Floating on water or growing on mud. These determinations verified by Dr. G. H. Conklin, Superior, Wisconsin.

Marchantia polymorpha L. Liverwort. On soil; mostly in low woods. Not very common.

Porella platyphylla (L.) Lindb. Common Porella. Collected on base of tree near Mud lake. The sterile specimen was determined by Miss Caroline C. Haynes, of New York.

SUB-CLASS MUSCI.

ORDER III. BRYALES.

Family Dinanaceæ.

Ceratodon purpureus (L.) Brid. Common on dry soil, decayed stumps and other situations.

Dicranella heteromalla (L.) Schimp. On soil on dry ridge, Estherville woods.

Family Fissidentaceæ.

Fissidens subbasilaris Hedw. On dry gravelly soil in Estherville woods.

Family Fumariaceæ.

Physcomitrium Hookeri Hempe. Urn Moss. Rare; collected once on shore of High lake.

Fumaria hygrometrica (L.) Sibth. Cord Moss. Common on ground in woods.

Family Bryaceæ.

Bryum cæspiticium L. Most common among thin grass in open ground, pastures, etc., where it is a conspicuous object in early May on account of its shining red seta. Also along sandy lake banks.

Bryum argenteum L. Silvery Bryum. On soil, High lake.

Bryum inclinatum (Sw.) B. and S. On soil especially along sandy lake banks. High lake and Mud lake.

Rhodobryum roseum (Wees.) Limpr. The Giant or Rose Bryum. Around the lakes; most common along the well-shaded banks on the south and southwest side of Mud lake. It is sometimes found forming tufts but more often the plants are scattered among other mosses. Whether seen individually or in tufts this moss is a most beautiful object.

Family Mniaceæ.

Mnium cuspidatum (L.) Legr. Pointed Mnium. Our most common species. Forming beautiful mats along shady banks and in woods.

Mnium affine Bland. var. *negicum* Schimp. This appears to be common in the Estherville woods. Specimens of a somewhat different appearing form, found in wet woods near Mud lake also were placed here by Mr. Kaiser.

Family Polytrichaceæ.

Catharinea undulata (L.) W. and M. Wavy Catharinea. Along shady hillsides in the Estherville woods.

Catharinea angustata Brid. Narrow-leaved Catharinea. Common in dry woods west of Estherville.

Polytrichium juniperinum Willd. Juniper Hairycap Moss. Common in dry woods west of Estherville. This and the tree moss are our largest mosses and are quite conspicuous objects where they occur.

Family Climaceaceæ.

Climacium americanum Brid. American Tree Moss. On soil in woods west of Estherville. Abundant along steep slope northwest of Oak Hill cemetery where it forms beautiful carpets of dark green.

Family Entodonaceæ.

Entodon sedutrix (Hedw.) C. M. Round-stemmed Entodon. Common; mostly on decayed woods.

Entodon cladorrhizons (Hedw.) C. M. Flat-stemmed Entodon. Common; especially on decayed wood.

Platygynum repens (Brid.) B. and S. Quite common in woods on decayed stumps and logs.

Family Leskeaceæ

Anomodon rostratus (Hedw.) Schimp. On soil, and in damp places in woods. High lake.

Anomodon minor (P. B.) Fuern. Blunt-leaved Anomodon. A very beautiful moss commonly growing on the north side of the trunks of trees in low ground, forming a conspicuous "apron".

Anomodon attenuatus (Schrib) Hueb. Slender Anomodon. Along banks of Mud lake; forming a dense mat on ground.

Leskea gracilescens Hedw. Very common; growing on the trunks and bases of trees.

Family Hypnaceæ

Amblystegium serpens (L.) B. and S. Creeping Hypnum. Common on soil or on decayed wood in damp shady places; also on sand or clay along lake shores.

Amblystegium riparium (L.) B. and S. On decayed wood, in low woods near High lake.

Amblystegium Kochii B. and S. On soil in wet shady ground near Mud lake.

Amblystegium varium (Hedw.) Lindb. On soil; banks of High lake.

Eurynchium serulatum (Hedw.) Lindb. On soil, in High lake woods.

Campylium chrysophyllum (Bria.) Bryhn. Some material of *Funaria hygrometrica* collected on banks of High lake was found to contain this species.

Dreponocladus aduncus (Hedw.) Wamst. var. *gracilescens* Schimp. Abundant in marshes and low meadows near High lake and Mud lake.

Family Brachytheceæ

Brachythecium oxycladon (Brid.) J. and S. Common on soil along shady lake banks and hill sides.

Brachythecium plumosum (Sw.) B. and S. Usual habitat on damp rocks. Collected in High lake woods on soil. A very pretty moss.

Brachythecium acuminatum (Hedw.) Lindb. Common in damp woods, on soil, or on decayed logs.

Brachythecium acutum (Mitte) Sulliv. Abundant on mud and among grass in small slough in High lake woods.

WALLINGFORD.